

Replacement Page 1, 1st Paragraph

BACKGROUND OF THE INVENTION

The invention relates to a device ~~in accordance with the preamble of claim 1~~ for taking powdered, grainy or granular substances, wherein the device comprises a storage receptacle for the substance as well as a supply tube for supplying the substance.

Replacement Page 3, 2nd and 3rd Full Paragraphs

SUMMARY OF THE INVENTION

Based on this, the invention has the object to provide a device of the aforementioned kind for taking powdered, grainy or granular substances which device is improved with regard to its function.

The technical solution is characterized in that the supply tube with its rearward end is pivotably supported by means of a unitary cylinder wall on a stationary cylinder body; the cylinder body has a through bore; the cylinder wall has a through opening; in the position of non-use of the supply tube, the inner opening of the supply tube and the through opening of the cylinder wall are not located within the area of the through opening of the cylinder body; and, in the position of use of the supply tube, the inner opening of the supply tube and the through opening of the cylinder wall are located in the area of the through bore of the cylinder body in which the substance is located by the features in the characterizing portion of claim 1.

Replacement Pages 5, 1st Full Paragraph, to Page 6 Last Full Paragraph

A technical realization of the device according to the invention is proposed by the further embodiment according to claim 2. The basic idea resides in that the supply tube with its rearward end is pivotably supported by means of a unitary cylinder wall on a stationary cylinder body, in that the cylinder body has a through bore and the cylinder wall has a through opening, wherein, in the position of non-use of the supply tube, the inner opening of the supply tube and the through opening of the cylinder wall are not located within the area of the through opening of the cylinder body, and, in the position of use of the supply tube, the inner opening of the supply tube and the through opening of the cylinder wall are located in the area of the through bore of the cylinder body in which the substance is located. Accordingly, at the end remote from the mouth the supply tube is rotatably supported. In the position of non-use of the device, all openings are closed while in the position of use they are open. In particular, in the case of a powder inhaler the airflow can be configured to be linear. This reduces the risk of turbulences as well as flow resistance to a minimum; this is so because the adhesion and friction play an important role when manufacturing and administering powder aerosols. During administration of the powder aerosol, adhesion and friction between medicament and auxiliary means must be overcome. However, these forces between the powder particles and the powder inhaler surface occur at the same time. Therefore, the linear profile of the airflow is advantageous.

A first application of the device according to the invention is proposed in claim 3 proposes that in the storage receptacle the substance is contained within several dosing units and that the storage receptacle has at a bottom side an outlet opening. The through opening of the cylinder wall, in the position of non-use of the supply tube, is located underneath the outlet opening of the storage container and, in the position of use of the supply tube, is in communication with the through bore of the cylinder body. The design is based on a reservoir for the substance from which several dosage units can be dosed.

The basic idea of the powder inhaler in claim 4 according to another embodiment resides

in that the cylinder body has a radial through bore as well as an upwardly extending continuous connecting bore extending transversely to the through bore, wherein the radial through bore during inhalation defines a continuous airflow that entrains the substance present within the through bore. The cylinder wall has an opening in the axial extension of the supply tube and the through opening of the cylinder wall, in the position of non-use of the supply tube, is located underneath the outlet opening of the storage receptacle and, in the position of use of the supply tube, is positioned above the connecting bore of the cylinder body. The cylinder wall of the supply tube has a through opening in the form of a bore whose height and diameter determines the metering volume and matches an oppositely positioned bore in the central cylinder body. In the closed state, the through opening of the cylinder wall is positioned precisely underneath the outlet opening of the storage receptacle so that dosing of the medicament is realized. In the folded-down state of the supply tube, the medicament than flows through the connecting bore in the cylinder body into the through bore and thus precisely into the air channel so that the medicament can be inhaled upon inhalation. The storage receptacle can be exchangeable for increasing economic efficiency.

A further development based thereon according to claim 5 proposes a one-way valve in the air channel so that the patient can only inhale the powder but cannot blow it out of the inhaler.

The Another embodiment according to claim 6 does not concern a powder inhaler but a device for dosing grainy or granular substances. The cylinder body has an angled through bore with a slant that is continuous relative to the earth's horizontal and the through opening in the cylinder wall is arranged and configured such that the through opening, in the position of non-use of the supply tube, is located underneath the outlet opening of the storage receptacle while the through bore is closed by the cylinder wall, and the through opening, in the position of use of the supply tube, is located above the inlet of the through bore of the cylinder bore and the inner opening of the supply tube communicates with the outlet of the through bore. The basic idea here is that the substance flows through the

outlet opening of the storage receptacle into the through opening in the cylinder which defines a dosing chamber. After pivoting of the supply tube into the position of use, the substance flows from this dosing chamber into the through bore of the cylinder body and from there into the supply tube.

A second application of the device according to the invention proposes that the storage receptacle is a capsule for a single dosage unit and the capsule is insertable into the through bore of the cylinder body, wherein the two ends of the capsule project such past the outer surface of the cylinder body that upon pivoting of the supply tube from the position of non-use into the position of use these ends are sheared off ~~is proposed in claim 7~~. This concerns a single-dose applicator employing a capsule. In this single-dose dosing device, the capsule is positioned in the cylinder body on the axis of rotation of the supply tube. By folding down the supply tube, the ends of the capsule are cut off by means of a cutting blade. In this way, a complete emptying of the capsule is possible. No splinters are produced. In contrast to other devices, it is not necessary to provide a protective screen that would increase the breathing resistance. An unopened capsule can be inserted only in the position of non-use into the supply tube. This holds true also for disposal of an emptied capsule. In this way, a perforce synchronization is realized in that the cutting of the capsule and the activation are realized in the appropriate pivot position of the supply tube while in the position of non-use an air-tight and water-tight closure of the supply tube is realized.

BRIEF DESCRIPTION OF THE DRAWINGS

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DESCRIPTION OF PREFERRED EMBODIMENTS

The powder inhaler of the first embodiment of Figs. 1a and 1b has a housing 1 in which a substantially funnel-shaped storage receptacle 2 for powder is located. This storage receptacle 2 has an outlet opening 3 at the lowest point.

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After folding down the supply tube 7 into the position of use (Fig. 3b), the through opening [6] 11 of the cylinder wall 8 is located in a position above the inlet of the angled through opening 5. The substance contained within the through opening 11 of the cylinder wall 8 flows from above into the through bore 5. As a result of its free flowing properties, the substance finally reach the inner opening 10 of the supply tube 7 from where the substance can be taken either orally or can be added to a drink or food or can be directly administered otherwise.